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ABSTRACT

Each year, thousands of high school students enroll and complete secondary occupational education courses, hoping to compete successfully in the job market once they leave school. Yet labor market statistics continue to suggest that America's secondary schools have not helped the non-college-attending high school graduate make an effective transition from school to work. The long-term effects of secondary occupational education and Co-op on the postsecondary labor market experiences of non-college-attending females and selected minorities were examined. A causal model was devised to determine the influence of taking secondary occupational education courses and participating in a Co-op, on length of employment and annual income for high school graduates entering the labor force. Analyses results indicated that non-college-attending youth, who took occupational education in high school, did not experience any long-term economic benefit from these occupational education courses. Linking early work experiences via Co-op had no effect on the labor market experiences of non-college-attending high school graduates 10 years after high school. (Author/RJM)

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Employment Consequences of Secondary Occupational and Academic Courses for Minorities and Females

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Abstract

Each year thousands of high school students enroll and complete secondary occupational education courses with the expectation of successfully competing in the job market once they leave school. Yet labor market statistics continue to suggest that America's secondary schools have not been very successful in assisting the non-college attending high school graduate effectively transition from school to work. The pathways for completing high school are varied. Which paths are best in preparing young people for the labor market remain unclear. This study examined the long-term direct and indirect effects of secondary occupational education and Co-op on the post secondary labor market experiences of non-college attending females and selected minorities. A causal model was devised to determine the influence of taking secondary occupational education courses and participating in Co-op on length of employment and annual income for high school graduates entering the labor force. Analyses results indicated that non-college attending youth, who took occupational education in high school did not experience any long-term economic benefit from these occupational education courses. Linking early work experiences via Co-op had no effect on the labor market experiences of non-college attending high school graduates ten years after high school.

Employment Consequences of Secondary Occupational and Academic Courses for Minorities and Females

In the 1980's and early 1990's, the school reform movement was focused primarily on improving the academic skills of students, with the implicit assumption that most high school students continue their formal education after graduation. Yet it has been estimated that approximately 20 million high school students are unlikely to continue their education once they leave high school (Fraser & Charner, 1993; William T. Grant Foundation, 1988a; U.S. GAO, August 1991). It is the movement of these non-college attending high school graduates into the labor market that this study examined. Specifically, this study attempted to determine if participation in various high school curricula led to different post-secondary labor market experiences for non-college attending youth.

In recent years educators and politicians have grudgingly acknowledged the shortcomings in secondary education that affect all students. Increasingly "school-to-work transition" has become the buzzword within the educational reform movement. For most people, school-to-work transition symbolizes a direct route all youth follow when leaving school and entering the work force. The reality is that the move from the classroom to the workplace is not a single event, but an extended process which may be composed of variations reflecting the changing needs of young people in society today (Fraser & Charner, 1993; Smith & Rojewski, 1993).

Secondary schools in the United States do not have a formal school-to-work transition system. Some researchers have described the current state of transition in this country as a "do-it-yourself" system (Bryne, Constant, & Moore, 1992). In general, this uncoordinated, fragmented service delivery has lessened the effectiveness of the transition services provided (Smith & Rojewski, 1993). In fact, it has long been assumed that the vast majority of young people in this country are perfectly capable of negotiating the path from school to work on their own; they can successfully find work and are eventually absorbed in to the full-time work force. The realities are sometimes quite different.

In place of a formal system for the moving from high school into the labor force, an informal system has been assumed--this informal system being secondary occupational education. Supporters of secondary occupational education have claimed that this curriculum provides students with skills and work attitudes necessary for successful careers.

Although secondary occupational education serves a variety of educational purposes, it has long been the prevailing view of many--including students and parents-- that it's main purpose is to provide high school students with job skills that will enable young people obtain jobs they would not otherwise get without additional training.

Armed with this perception, each year thousands of young people enroll and complete high school occupational education courses with the expectation of successfully competing in the labor market once they graduate. Yet, labor market statistics continue to indicate that secondary schools have been unsuccessful in assisting America's non-college attending high school students in moving from the world of school to the world of work. For certain non-college attending subgroups of the population--ethnic minorities and women--who typically experience significant difficulties in the labor market, empirical data on the post secondary economic benefit of high school occupational education has been difficult to determine.

One direct consequence of not having a formal school-to-work transition system has been that young people who graduate from high school, but do not go directly to college, cost society socially and economically. Many go from one low-paying job to the next until their mid-20's (Smith & Rojewski, 1993). The result for some has been a life of employment that pays less than a living wage, offering neither self-respect nor a chance for upward mobility (Grant Foundation, 1988a).

More remarkable has been data indicating that 20% of non-college attending youth will be unemployed six years after graduating from high school (Institute on Education and the Economy [IEE], 1992). Should these non-college attending high school graduates remain in the ranks of the unemployed, they will

cost society an estimated $50,000 each year for food, housing, health care, welfare benefits or prison care (Fraser & Charner, 1993).

It is typically assumed that non-college attending youth will be better prepared for employment if they take cccupational education and have some kind of work experience while in high school, however empirical evidence regarding the consequences of either secondary occupational courses and/or high school work experience has been mixed. Given the hurdles non-college attending youth face in their search for economically viable careers, does taking occupational courses during high school improve their chances of being gainfully employed after graduation?

To date, the direct and indirect economic benefits of taking occupational education courses have been difficult to determine. Ambiguities in the research conducted to date with regards to post graduation labor market benefits of either taking secondary occupational education courses and/or working during high school, indicated that additional research in this area was warranted.

What Is Known About the Labor Market Experiences of Non-college Attending Youth

High School Graduates in the Work Force

In recent years fewer and fewer non-college high school graduates have been able to obtain full-time employment. In 1986, it was estimated that less than 49% of male high school

graduates and 42% of female high school graduates were working full-time two years after graduation (Grant Foundation, 1988a; U.S. Bureau of the Census, 1987). Furthermore, Fraser and Charner (1993) indicated that these dismal employment rates remain constant up to five years after graduation.

In 1986, the work force participation rate for persons with high school diplomas was 82.7% (U.S. Bureau of Labor Statistics, 1986a, 1986b). When gender differences in employment rates were examined, the participation rate for males was 89.7%, whereas the rate for females was 76.1% (U.S. Bureau of Labor Statistics, 1986a, 1986b). Based on these data, it appears that, for females, the transition from high school to full-time employment has been more difficulty than for their male peers.

Recent labor statistics indicated that little has changed in the last seven years for non-college attending youth attempting to enter the work force. In 1992 the unemployment rate for persons 16 years old and older was 7.3%, while during the same period the unemployment rate for high school graduates was 11.6% (U.S. Bureau of Labor Statistics, 1993). Gender inequities also continued, with male high school graduates employed at a rate of 87.5% and females employed at a rate of 71.6% (U.S. Bureau of Labor Statistics, 1993).

African American High School Graduates in the Work Force

In 1986 the labor force participation rate for African American high school graduates was 74.9% (U.S. Bureau of Labor

Statistics, 1986a). A slight gender difference in the participation rate for this subgroup of the high school graduate population was indicated; males participated in the work force at a rate of 69.4%, whereas females were employed at a rate of 54.2% (U.S. Bureau of Labor Statistics, 1986b). What these statistics failed to reflect was the massive unemployment among African American high school graduates.

Unemployment data for 1992 revealed an ever widening gap of unemployment between African American and white high school graduates. In 1992, the unemployment rate was 11.6% for all high school graduates, 15.6% for whites completing high school, and 38.9% for African Americans with the same educational attainment (U.S. Bureau of Labor Statistics, 1993).

Hispanic/Latino American High School Graduates in the Work Force

In 1986, 77.9% of all Hispanic/Latino high school graduates participated in the labor force (U.S. Bureau of Labor Statistics, 1986a, 1986b). In general, this rate was comparable to that of African Americans. Gender differences in work force participation rates was again found. Hispanic/Latino males were employed at a rate of 78.8% and females employed at a rate of 54.2% (U.S. Bureau of Labor Statistics, 1986a, 1986b).

Recently, the unemployment rate cited for this subgroup of the population ranged from 17% to 19.9% (Fraser, Hubbard, Charner & Weinbaum, 1993; U.S. Bureau of Labor Statistics, 1993).

For non-college attending minorities these are devastating statistics, yet labor participation rates do not tell the entire story for this segment of America's youth. To fully grasp the harsh economic realities faced by non-college attending youth, the post graduation earnings for high school graduates who gain employment must be considered.

Earnings For High School Graduates In The Labor Force

Despite increased employment over the last decade, non-college attending minorities and females are still less likely than white male high school graduates to hold professional, managerial, and technical positions in the labor force. According to Hamilton and Powers (1990) most non-college attending youth continued to be employed in low paying positions similar to those they held during high school. Although many high school graduates reduce the time they spend unemployed by continuing to hold the same job they held while in school, these jobs seldom pay enough to make these high school graduates financially independent and upwardly mobile in terms of careers.

In 1992 the median annual income for all households was $30, 786, with males earning $26, 472 and females earning $16, 227 (U.S. Bureau of the Census, 1993). When earned income was examined relative to educational attainment, individuals completing only high school earned considerably less. Male and female high school graduates earned $22, 765 and $13, 266 respectively (U.S. Bureau of the Census, 1993).

African Americans and Hispanic/Latino Americans continued to be concentrated in low paying, low skilled jobs. In general, only 15% of African American high school graduates and 11% of Hispanic/Latino American's graduating from high school held managerial or technical positions (U.S. Bureau of Labor Statistics, 1986a, 1986b). The employment patterns for these minority subgroups has resulted in earned incomes significantly below that of their white peers.

Recently, earned income for African American males and females, who attain only a high school diploma, was reported to be $16, 588 and $12, 762 respectively. For Hispanic/Latino American high school graduates, males earned $18, 951 and females earned $12, 710 (U.S. Bureau of the Census, 1993).

These data indicated that, for many high school graduates, being employed does not guarantee net incomes above the poverty level. In fact, one in five households headed by high school graduates live in poverty (Fraser & Charner, 1993). Long-term unemployment and underemployment continues to be the plight among a significant portion of America's non-college attending minority and female youth. These trends lend support for a closer examination of the link between secondary occupational education, in particular, and transition into the work force for minority youth who end their formal education with high school graduation.

What Is Not Known About the Labor Market Experiences of

Non-college Attending Youth

As educators continue to experiment with various solutions to remedy the school-to-work dilemma non-college attending youth experience, questions remain. Are non-college attending youth better off after high school economically if they take occupational courses? To this point the answer remains ambiguous: white males and minority females appeared to gain some short-term benefits, yet these gains have not been consistent across the various studies. Do non-college attending high school students benefit from working during high school once they graduate and attempt to enter the labor market? The extend to which non-college attending students benefit from working during high school appears to accrue to whites. African American and Hispanic/Latino American youth, who continue to encounter barriers to economic attainment, do not appear to benefit from working while in high school to the same extend as white youth.

This study investigated the direct and indirect effects of secondary occupational education course work, academic course work, and secondary Co-op experience on long-term (ten years after graduation) labor market experiences of African Americans, Hispanic/Latino Americans, and female subgroups of non-college attending high school graduates. The study focused on three questions. Briefly stated:

1. Over the long-term, what effect does taking secondary occupational education courses, compared to taking more

academic courses, have on the earned income and employment length of non-college attending females and selected ethnic minority high school graduates?

2. Does participation in high school Co-op have any long-term effects on earned income and employment length for selected minority and female non-college attending high school graduates?
3. When non-college attending youth combine secondary occupational education with Co-op experience, what additive effect does secondary Co-op experience have on long-term post secondary labor market experiences in terms of earned income and length of employment?

Methodology

Data Source

Data for this study were drawn from the base year (1980) through fourth follow-up (1992) of the 1980 sophomore cohort in the National Center for Educational Statistics High School and Beyond longitudinal (HS&B) study and the 1982 HS&B Secondary Transcripts Study (HSTS). The 1980 base year HS&B sample included over 30,000 sophomores enrolled in high schools across the United States (Frankel, Kohnke, Buonanno, & Tourangeau, 1981). The fourth follow-up of the 1980 sophomore cohort included approximately 14,825 sample members retained from the base year and previous follow-ups (NCES, 1995).

High school transcripts were collected for the sophomore cohort prior to the first follow-up. The HSTS transcripts include all academic and occupational education courses taken by students. This sample was restricted to those who graduate from public school and included approximately 9,400 persons from the 1980 sophomore cohort (NCES, 1992).

The public release version of the Data Analysis System (DAS) for HS&B was used to select variables used in the analyses of the data for this study. The DAS contains raw data specific to the HS&B sophomore cohort as well as derived composite variables for some of these data. The public release version of the DAS does not contain all the variables collected as part of HS&B, but did contain those which were of interest in these analyses.

While HS&B provides a nationally representative sample of high school students, sampling characteristics reduce its representiveness. Some groups of student (e.g., minorities) were over sampled, resulting in differences in participation by different groups in the follow-ups. To increase representation, several weighting variables are provided in the HS&B DAS. All analyses reported for this study were based on matrices weighted by the appropriate weighting variable.

Subjects

This study was concerned with non-college attending, non-disabled high school graduates. Therefore subjects included in

the analyses were selected from the 1980 sophomore cohort by applying the following criteria:

1. graduated from high school in May or June 1982;
2. did not attended post-secondary school or college between June 1982 and January 1993, and
3. did not participate in educational programs for students with disabilities or indicate the existence of a disabling condition.

Only those students who participated in all surveys (base year through fourth follow-up and transcripts) and met the criteria stated previously, were included in the present analyses. Matrices were produced using pairwise deletion of missing values.

All members of the 1980 sophomore cohort, who met the criteria (minimum pairwise n = 313), were used in the initial analysis of the causal model. Selected subgroups of this sample of high school graduates were further partitioned to allow for the testing of the causal model for females (minimum pairwise n = 108), African Americans (minimum pairwise n = 74), and Hispanic/Latino Americans (minimum pairwise n = 42) separately.

Exogenous Variables

Exogenous variables are constructs within the path model that are influenced by causes outside the causal model under consideration in the present study. No predictions were made about what influences SES, ability, or high school size have on

outcomes. The exogenous variables included in the hypothesized causal model examined are briefly described below.

Socioeconomic Status (BYSES). This variable in the HS&B data was a percentile composite constructed using first follow-up data. This variable was based on five components: (1) father's occupation, (2) father's education, (3) mother's education, (4) family income, and (5) material possessions in the household. This variable was originally coded as a standard normal variable (zero mean, unit variance), but in the DAS was converted to percentile using the SAS rank order procedure called PROC RANK with the following parameters: GROUP=100 OUT=<data set name> VAR BYSES; RANK BYSES (HS&B, 1995).

Ability (BYTEST). This variable was a test composite score based on the average of non-missing reading, vocabulary, and mathematics (part 1) standardized scores from test administered during the base year of data collection for the 1980 sophomore cohort.

High school size (SB002A). This variable was from the 1980 and 1982 school questionnaires completed by school administrators. It reports actual student head count reported by those schools participating in HS&B.

Endogenous Variables

Endogenous variables are those whose variation is predicted to be partially explained by the exogenous and other antecendent endogenous variables in the hypothesized causal model. The

endogenous variables in the proposed causal model are described below.

Occupational curriculum (CTII). This was the sum of Carnegie units that students in the 1980 sophomore cohort earned. Carnegie units are standardized measures used in secondary education to represent completion of a high school course that meets one period per day for an academic year (NCES, 1992). This variable was based on high school transcripts, [A1] using the taxonomic hierarchies of Classification of Secondary School Courses (CSSC) codes defined in the April 1992 NCES report "Occupational education in the United States: 1969-1990". The occupational curriculum is composed of three curricular areas: 1) consumer and homemaking education, 2) general labor market preparation, and 3) specific labor market preparation (NCES, 1992). A more detailed description of this taxonomy has been provided in the Appendix.

Academic credits earned (CTI). This variable was the sum of Carnegie units students in the 1980 sophomore cohort earned in six main subject areas based upon the aforementioned taxonomic hierarchies of CSSC codes. The subject areas include: 1) mathematics, 2) science, 3) English, 4) social studies, 5) fine arts, and 6) foreign languages.

Co-op work experience during high school(FY11A3). This binary variable was based on respondent response to the question: "In your junior or senior year, have you heard of or participated in the following High school education program?" Co-op was among

the options listed and responses ranged from "heard of and participated" (coded 1) or heard of but have not participated" to "never heard of, have not participated (here both were coded 0).

Employment (AVELFPM1). This variable measured the average length of labor force participation for respondents since the attainment of their highest degree. It was a composite variable constructed by dividing respondent's reported months of labor force participation, since 1982, by the number of 'spells' of no labor force participation within the period 1982-1992. A spell of no labor force participation was counted when the time lapse between two employment status points in time was separated by more than one month. Values for this variable were coded as missing if the respondent never participated in the labor force or when the required number of months variable were missing (NCES, 1995).

Income (RELERA10). This variable reported the real annual earnings, in 1992 dollars for respondents ten years after high school. It included all respondents who were in the labor force at some point during 1992.

Analyses Procedures

Path analysis was used to examine the direct and indirect effects of variables hypothesized as causes of variables treated as effects and attempts to determine if a theoretical model successfully accounts for the actual relationships observed in the study data.

All analyses were conducted using the SAS System's CALIS procedure and were performed on variance-covariance matrices. The maximum-likelihood method of parameter estimation was used in all analyses. Covariance matrices were used because analyses performed using correlation matrices are generally less desirable. When correlation matrices are analyzed they are likely to provide invalid standard errors of parameter estimates, which then result in significance tests for the path coefficients being inaccurate (Hatcher, 1994).

Proposed causal model

This study was interested in the long-term direct and indirect effects of secondary occupational education and Co-op experience on post-secondary employment and earnings for non-college attending youth. The hypothesized model as shown in Figure 1 identifies the predicted determinants of a non-college attending high school graduate's post-secondary labor market experiences, in terms of length of employment and earnings. It is the hypothesized causal model for all non-college attending high school graduates and for the aggregated female, African American, and Hispanic/Latino American high school graduate subgroups examined in this study.

As shown in Figure 1 the hypothesized model considers three exogenous variables (e.g. SES, ability, and high school size) to be correlated, however these relationships were not analyzed in the present study. The remaining variables in the model are

endogenous and were hypothesized to have explicit causes represented in the model.

The SES and ability variables were expected to exert positive effects on academic credit, months employed and annual income, while exerting negative effects on occupational education curriculum and Co-op experience. In other words, students with more ability or who come from higher SES backgrounds were expected to take more academic courses in high school, and to work more months and earn more annually after graduation.

The high school size variable was expected to exert a positive effect on academic credit and Co-op experience; a negative effect on occupational education curriculum, and no effect on months employed and annual income. That is, as high school size increases students take more academic courses in high school due to the availability of a greater range of these type courses. They are expected to take fewer classes within the occupational education curriculum and are less likely to participate in high school Co-op. High school size was expected to have no direct effect on how many months high school graduates work or how much they earn annually after graduation.

Academic credit, occupational education curriculum, and Co-op experience were considered dependent on SES, ability, and high school size. It was expected that taking academic courses would negatively influence participation in secondary occupational education and Co-op. The direction of this effect was based on

the fact that students who take more academic courses in high school have decreased opportunities to take occupational courses or participate in Co-op due to maximum course credit limitations. On the other hand, it was expected that increased participation in secondary occupational curricula would positively effect Co-op participation, given the similarity in instructional goals.

Finally, months employed and annual income were expected to be dependent on the exogenous variables of SES, ability, and high school size and all preceding endogenous variables. Positive effects on months employed and annual income were expected from the predetermined variables of academic credit and Co-op experience.

Occupational education curriculum was expected to have a negative effect on months employed and annual income. This hypothesized effect was based, in part on findings reported in the literature. Specifically, the findings of Campbell and his colleagues indicating that African Americans and females had less continuous labor force participation than white males and no clear payoff in terms of earnings for students who participated in occupational education during high school (Campbell et al., 1986).

A second reason for the negative hypothesized effect of secondary occupational education participation on post-graduation labor market outcomes was the fact that high school occupational course taking decreased during the 1980's. Furthermore students

who took occupational courses were less likely to concentrate their course work within a given concentration area (U.S. Department of Education, 1994). Given that secondary occupational education is typically viewed as the curriculum which trains students for entry-level jobs, it was speculated that non-college attending students who take few occupational courses are unlikely to have the skills needed for jobs employing new technology. It has been reported that students who concentrate their high school occupational course work in a particular area were more likely to find training related jobs, earn more money and have lower incidences of unemployment (Boesel & McFarland, 1994).

To date, there is little evidence that non-college attending high school graduates do better in the labor market if they take secondary occupational courses. In contrast it has been reported that non-college attending graduates who take academic courses experience short-term, small positive effects on earnings and employment (Boesel & McFarland, 1994).

Results

Descriptive Statistics

The means and standard deviations for all variables utilized in this study are shown in Table 1. Examining the means for annual income, it can be seen that young people who did not continue their education beyond the attainment of a high school diploma, had mean annual incomes significantly below the mean poverty level income of $12,674 for a family of four reported by

the U.S. GAO (1993). While the mean income for Hispanic/Latino American high school graduates was higher than that of female and African American high school graduates, this difference may be a reflection of differences in employment length for the various subgroups.

In terms of length of employment, Hispanic/Latino American high school graduates had longer labor force participation, on average, since graduating in 1982 than females or African Americans with only a high school education. No substantial difference in length of employment for females and African American high school graduates was evident.

The four subgroups of high school graduates examined had comparable secondary occupational education participation and earned comparable academic credits while in high school. These subgroups also participated in secondary Co-op experiences at approximately the same rate; however, Hispanic/Latino American high school graduates participated at a lower rate than females and African Americans who completed high school.

One can also see in Table 1 the necessity for controlling for the exogenous variables in assessing the long-term impact of occupational education on post-secondary employment and income for non-college attending youth in general, and female, African American, and Hispanic/Latino American subsamples in particular. Ability and SES evidenced mean differences between female, African American, and Hispanic/Latino American high school

graduates. By examining the means alone it would appear that African American and Hispanic/Latino American high school graduates, who did not continue their education, were from lower SES families, when compared to all non-college attending high school graduates in general. Furthermore, it would appear that African American and Hispanic/Latino American high school graduates had lower ability scores than female high school graduates.

Tables 2 through 5 display the intercorrelation matrices for variables used in the analyses of data for the all high school graduates subgroup, and for female, African American and Hispanic/Latino American high school graduate subgroups, respectively. The correlations reported were based upon minimum pairwise n's for each subgroup.

Using path analysis, least-squares estimates of the parameters for the hypothesized causal model of economic outcomes were obtained. Tables 6 through 9 show the estimates for each subgroup of high school graduates examined.

In the analyses for all high school graduates (see Table 6) the predetermined variables together accounted for only 1.7% of the variation in annual income and 2.7% of the variation in average length of months employed for these young people who did not continue their education beyond high school. Of the remaining variables in the model for all high school graduates 1.7% of the variation in academic credit was accounted for by SES, ability

and high school size. Furthermore these three exogenous variables accounted for 6.1% of the variation in occupational education curriculum, and 4% of the variance in Co-op experience.

In the analyses for the female subgroup of high school graduates who did not continue their education beyond high school (see Table 7), the predetermined variables together accounted for 7% of the variance in annual income and 5.3% of the variance in length of labor force participation. For this subgroup SES, ability and high school size accounted for 13.6% of the variance in academic credit earned, 9.4% of the variance in occupational education curriculum, and 2.9% of the variation in Co-op experience.

In the analyses for the African American subgroup of high school graduates (see Table 8) the predetermined variables together accounted for 5.5% of the variation in annual income and 11.5% of the variance in average length of months employed ten years after graduation. For African Americans who do not continue their education beyond high school SES, ability, and high school size accounted for 22.2% of the variation in academic credits earned in high school, 17.3% of the variance in occupational education curriculum participation, and 8.3% of the variation in Co-op experience.

The final subgroup of non-college attending high school graduates which were examined was Hispanic/Latino Americans (see Table 9). For this subgroup, the predetermined variables in the

model accounted for 13.5% of the variance in annual income and 31.2% of the variation in average months employed since graduation. SES, ability, and high school size together accounted for 13.5% of the variance in academic credits earned during high school, 36.6% of the variance in occupational education curriculum, and 4.1% of the variation in Co-op experience.

Discussion

A review of the literature on non-college attending individuals revealed a number of critical issues and problems related to conceptualizing a model of transition for youth seeking to enter the world of work immediately following high school. A simple model of how all young people move from high school to the labor force does not exist. The transition needs of ethnic minorities and females differ. The purpose of the current research was to test a hypothesized model of predicted determinants of post-secondary labor market experiences for non-college attending minority and female high school graduates. This study sought to determine the extent to which participation in secondary occupational education and working during high school resulted in significant long-term economic benefit for selected ethnic minority and female youth after graduation.

Long-term Post Secondary Labor Market Experiences

The first question this study sought to answer was whether the long-term post secondary labor market experiences of non-college attending youth, in general, and females and selected

ethnic minorities in particular, who participated in secondary occupational education differed from members of these subgroups who took more academic courses during high school. Across the United States high school students can choose between taking more academic courses and fewer occupational courses or vice versa, but what does this trade off mean in terms of post graduation employment length and earned income?

Influences of high school courses on post-graduation labor market experiences. For African American, Hispanic/Latino American, and female high school graduates, who entered the work force without continuing their education, did participation in a particular high school curriculum lead to different labor market experiences in terms of length of employment and earned income ten years after graduation? In this study it was found that earning more academic credit during high school had a negative effect on average employment length for African American and Hispanic/Latino American subgroups of non-college attending high school graduates, yet had a positive effect on average employment length for the female subgroup. In contrast, for African American and Hispanic/Latino American subgroups of non-college attending high school graduates examined, academic credit earned during high school had a positive direct effect on earned annual income, while earning more academic credits had a negative effect on the earned annual incomes of female high school graduates.

In other words, ten years after graduation from high school, non-college attending females who took more academic courses during high school had longer continuous periods of employment since graduation. African American and Hispanic/Latino American high school graduates who took more academic courses in high school changed jobs more frequently or had shorter, less continuous periods of employment in the ten years since finishing high school. It was not possible, based in the analyses performed in this study, to determine if African American and Hispanic/Latino American non-college attending high school graduates who took more academic courses average fewer months of continuous employment because they elected to change jobs or if extraneous factors in the United States economy influenced their average length of employment since graduation from high school. While highly speculative, either reason could possibly explain the finding of the present analyses for these two subgroups of non-college attending high school graduates.

Furthermore, it is possible that differences in earned income for the various subgroups of non-college attending high school graduates who took academic courses during high school may be the result of females holding lower paying positions for longer periods of time, while African American and Hispanic/Latino American high school graduates may have changed jobs more frequently seeking to increase their income. In fact, it has been previously reported that academic courses have a

small positive effect on wages and that this effect increases over time (Boesel & McFarland, 1994).

Finally, it had been predicted in the hypothesized model presented previously (see Figure 1), that for all subgroups of non-college attending high school graduates examined, participation in secondary occupational education would have direct negative effects on average employment length and earned annual long-term. The results obtained from this study were consistent with the previously predicted outcomes. For female, African American, and Hispanic/Latino American high school graduates who did not continue their education beyond high school participation in secondary occupational education resulted in no positive, long-term effect on either average employment length or earned annual income after graduation. In fact, when secondary occupational education participation increased among African American, Hispanic/Latino American and female high school graduates who entered the labor force without continuing their education, the average length of employment for these young people decreased as did their annual income.

It is possible to speculate as to why participation in secondary occupational education had negative long-term effects on average length of employment and annual income for the subgroups of non-college attending youth examined. First, it would be easy to blame secondary occupational education for not adequately preparing non-college attending youth to succeed in

the labor force with just a high school education, yet one must resist the temptation to paint all secondary occupational programs with the same broad brush. Secondary occupational education across the United States is a diverse, wide ranging curriculum varying in the quantity and quality of programs offered to high school students. While some schools understand the needs of the businesses and companies within their community, many more do not. In recent years public schools have found themselves fighting for adequate funding to meet the basic educational needs of their citizens. The end result, in many cases, has been secondary occupational education programs which lack the technological tools and funding needed to prepare students to leave the classroom and enter the labor force.

Second, over the last decade, the move across America has been away from the manufacturing jobs once available to high school graduates towards high performance, high technology workplaces which require some post-high school training for even entry level positions. The result of this trend has been that in the 1980s the earnings of high school graduates fell 9 percent (Boesel & McFarland, 1994).

Third, it is possible that hiring practices among employers do not reward school achievement within the secondary occupational education curriculum and that employers are reluctant to hire many high school graduates for career-ladder positions within their companies. This reluctance may be due, in

part, to the perception within the employment community that youth who take more occupational education courses in high school did so because they did not have the ability to succeed in the "more challenging" academic courses. This leads to the view, whether accurate or inaccurate, that these high school graduates who take more occupational courses lack the active thinking, communication, and collaboration skills needed to keep their companies competitive in the global marketplace.

Finally, Campbell et al (1986) speculated that the reason occupational education does not result in positive economic outcomes for African American, Hispanic/Latino American, and female subgroups of high school graduates is that a majority of these graduates do not get training related jobs after high school.

Whatever the reason for the long-term negative effect secondary occupational education has on length of employment and annual income, it is clear that high school graduates who could once find relatively stable, well-paying manufacturing job have in recent years found these position more difficult to obtain. They find themselves moving from one low-paying job to another, unable to find stable positions paying more than minimum wage.

The second question the present research attempted to answer was what long-term effect participation in Co-op during high school has on earnings and employment length for female, African American, and Hispanic/Latino American non-college attending high

school graduates. Although there is general agreement among educators that young people who are not going to college benefit from some kind of work experience during high school, there is disagreement about the value of early work experiences that do not integrate school experience with work outside the classroom. One recent report indicated that while a majority of students work during high school, only about three percent enroll in Co-op programs (Fraser & Charner, 1993).

Influences of Co-op experience on post-graduation labor market experiences. For the non-college attending high school graduate subgroups examined, the mean Co-op participation rate for all high school graduates was 15%, while for the aggregated subgroups of females, African American, and Hispanic/Latino American the mean Co-op participation rates were 12%, 11% and 7%, respectively. Early work experience gained from Co-op participation during high school was found to have a negative direct effect on average length of employment for all subgroups of non-college attending high school graduates examined. Although previous research by Lewis and his colleagues (1983) reported that respondents with early work experience spent relatively less time unemployed, this earlier examination analyzed data two years after respondents graduated from high school. It is possible that early work experience gained from Co-op participation does initially provide non-college attending high school graduates with more opportunity for a smooth transition into the labor

force, yet the findings of this study indicate that reported advantages of early work experience do not persist over time.

Finally, this study found that the only subgroup of non-college attending high school graduates for whom participation in Co-op had a positive direct effect on annual income were females. It is possible that the Co-op experiences of African American and Hispanic/Latino American high school graduates were in lower paying service jobs providing little opportunity for advancement and income growth should these individual continue to work in these jobs after graduation.

Variables Influencing High School Curriculum Selection

Previous research has indicated that participation in high school occupational programs decrease as students socioeconomic status and academic ability increase (NCES, 1992). The findings from analyses conducted during this study were basically consistent with those reported by NCES. For non-college attending high school graduates in general, and for the female and African American subgroups of non-college attending high school graduates examined in this study, SES and ability had a direct positive effect on whether these youth took more academic courses during high school. As SES and ability increased the number of Carnegie units earned by these youth in academic areas also increased. Unexpectedly, SES had a direct negative effect on earned academic credits of the Hispanic/Latino American subgroup examined. For these young people, as SES increased the number of Carnegie units

earned in academic areas decreased. Why this effect occurred is unclear and no plausible explanation can be proposed, at this time.

For all subgroups of non-college attending youth examined SES and ability had direct negative effects on participation in secondary occupational education. This finding was consistent with previously stated expectations. If SES and ability positively effect academic course taking during high school, then finding the converse effect for secondary occupational course taking should not be surprising. The direction of this effect has several possible explanations. Students who take more academic courses during high school either (a) have fewer opportunities to take occupational courses due to maximum course credit limitations or (b) do not tend to substitute occupational courses for academic courses, selecting instead courses from personal/other curricula options available at the high school level.

A final variable thought to influence high school curriculum selection was high school size. It was expected that as high school size increased, the number of Carnegie units earned in academic subjects would increase while participation in secondary occupational education would decrease. This expectation was based on the fact that researchers at NCES (1992) had found that as high school size increased the average number of occupational courses taken decreased.

In the current study the expected effect of high school size on academic course taking and occupational education participation was found for the female subgroup of non-college attending high school graduates but not for African American and Hispanic/Latino American subgroups examined. For these subgroups of the non-college attending sample, high school size had a negative effect on academic course credit earned during high school. One possible explanation for why increased school size led to fewer academic courses being taken by youth in the African American and Hispanic/Latino American subgroups is that as high schools became larger, less attention is given to guiding and 'encouraging' non-college attending ethnic minorities into academic courses. A second and equally plausible explanation is that African American and Hispanic/Latino American youth are more likely to be concentrated in economically depressed inner city schools where the breath of academic course offerings might not be as extensive as those found in middle and upper middle income suburban schools.

Variables Influencing Co-op Participation During High School

Of the variables predicted to influence Co-op participation during high school only SES and occupational education participation were found to have positive direct effects on Co-op participation for all subgroups examined. While the positive effect of occupational education was expected, the positive effect of SES on Co-op participation was somewhat unexpected.

It is possible that the positive effect of SES on Co-op participation was due to students from higher SES family backgrounds perceiving some long-term benefit from early work experiences and therefore they sought early work experience related to their interest and long-term career goals.

Of the remaining variables in the hypothesized model, ability had a positive direct effect on Co-op participation for African American high school students, while academic course credit had a positive direct effect on Co-op participation for Hispanic/Latino American high school graduates. Finally, as high school size increased Co-op participation decreased for the female and African American subgroups of non-college attending high school graduates examined. Why high school size negatively influenced Co-op participation for these two subgroups of high school graduates was unclear.

Combined Effect of Secondary Occupational Education and Co-op on Post-graduation Labor Market Experiences

The last question this study sought to answer was whether secondary occupational education in conjunction with early work experience gained through Co-op had any long-term effect on the post-secondary labor market experiences of non-college attending female, African American, and Hispanic/Latino American high school graduates. Table 10 displays the indirect causal effects on average employment length and annual income implied by the hypothesized model examined in this study. These results showed

no indirect effect of secondary occupational education participation on average length of employment or annual income for any non-college subgroup of high school graduates examined.

In other words, when non-college attending youth combine secondary occupational education with Co-op experience, the additive effect of Co-op experience does not result in longer average employment length nor increased annual income earnings for the subgroups of high school graduates examined.

Conclusions

Previous research on the short-term economic benefits of participation in secondary occupational education for non-college attending youth have typically been ambiguous, while early work experiences have been found to improve employability and earnings after high school. Little was known about the long-term benefit of taking secondary occupational courses and gaining early work experience on the post secondary labor market experiences of non-college attending youth.

The results of this research suggest that non-college attending youth, who take occupational education in high school with the expectation of improving their post secondary labor market outcomes, are not likely to experience any long term benefit. In fact, it did not appear to matter whether non-college attending youth took more academic courses or more occupational courses in high school; in general, these young people had less

continuous labor force participation and reported low annual incomes long term.

Surprisingly, linking secondary occupational education participation with early work experiences gained via Co-op had no effect on the labor market experiences of non-college attending high school graduates ten years after high school.

This research helped illuminate the unanswered question concerning the long-term economic effects of secondary occupational education for non-college attending youth; however the results reported here should be interpreted with caution. This study had several limitations.

First, HS&B was not designed specifically for the purpose of this study. The HS&B longitudinal study data are collected to provide information for the reformulating of educational policies which affect the transition of youth from school to work (Jones, Sebring & Campbell, 1986). Data within HS&B did help in evaluating the effectiveness of secondary occupational education for non-college attending youth seeking to enter the labor market.

Secondly, sample size did not permit stratification by each ethnic minority subgroup in the non-college attending population. The analyzes were most complete for females, African Americans, and Hispanic/Latino Americans.

Thirdly, no attempt was made to subdivide the occupational courses taken by subjects in this study into specific

occupational groupings. While Johnson, Dupuis, Musial and Hall (1994) indicated that secondary occupational education curricula can be divided into four types of occupational specific programs, these programs and courses offerings vary greatly from school district to school district. Therefore, analyzes in this study were based on course credits earned by study participants across the secondary occupational curriculum.

Third, these results may not generalize to non-college attending youth who graduated in the late 1980s. Secondary occupational education curriculum has recently bolstered it's academic component and these changes are not reflected in the data collected on non-college attending youth who graduated over a decade ago. In fact, in a recent survey completed by the Virginia Department of Education (1995) it was found that 41% of high school students in Virginia completed a occupational program while in high school and that 58.3% of 1993-94 high school graduates reported that they were continuing their education.

While the results of the Virginia study are promising in terms of how many young people are electing to continue their education once they graduate high school, on average young people who do not continue their education do poorly in the labor market over the long term. Additional research on the long-term implications of secondary occupational education is needed Without continued research in this area the young people who remain most at-risk for unemployment and/or underemployment--

minorities and women, non-college attending youth--will never gain what it takes to achieve long-term productive employment. They will be a permanent burden on society.

References

Boesel, D. & McFarland, L. (1994, July). National Assessment of Vocational Education: Final Report to Congress (Vol.1). Washington, DC: U.S. Department of Education, Office of Educational Research and Improvement.

Byrne, S.M., Constant, A., & Moore, G. (1992, March). Making transitions from school to work. Educational Leadership, 49(6), 23-26.

Campbell, P.B., Basinger, K.S., Dauner, M.B., & Parks, M.A. (1986). Outcomes of vocational education for women, minorities, the handicapped and the poor. Columbus, OH: The National Center for Research in Vocational Education, The Ohio State University. (ERIC Document Reproduction Service No. ED 266 315)

Frankel, M.R., Kohnke, L., Buonanno, D. & Tourangeau, R. (1981). Sample Design Report. (Prepared for Center for Educational Statistics). Chicago: National Opinion Research Center, University of Chicago.

Franklin, R.S. & Resnick, S. (1973). The political economy of racism. New York: Holt, Rinehart & Winston.

Fraser, B.S., Hubbard, S.L., Charner, I., & Weinbaum, A. (1993, September). School reform and youth transition: Literature review and annotated bibliography. Washington, DC: Academy for Educational Development, National Institute for Work and Learning.

Hamilton, S.F. & Powers, J.L. (1990, December). Failed expectations: Working class girls' transition from school to work. Youth and Society, 22(2), 241-262.

Hatcher, L. (1994). A step-by-step approach to using SAS system for factor analysis and structural equation modeling. Cary, NC: SAS Institute, Inc.

High School & Beyond Fourth Follow-up (Sophomore Cohort) HS&B: 1992. [CD ROM data file]. (Feb., 1995). Washington, DC: National Center for Education Statistics [Producer and Distributor].

Institute on Education and Economy. (1992, March). Post-high school employment and schooling patterns of non-college bound youth (IEE Brief No. 3). Washington, DC: Author.

Johnson, J.A., Dupuis, V.L., Musial, D., & Hall, G.E. (1994). Introduction to the foundation of American education. Boston: Allyn and Bacon.

Jones, C., Sebring, P., & Campbell, S. (1986, September). Two years after high school: A capsule description of 1980 sophomores. (Prepared for the Center for Statistics, Contract No. OE 300-82-0273). Chicago: National Opinion Reset Center, University of Chicago.

Lewis, M.V., Gardner, J.A., & Seitz, P. (1983). High school work experience and its effects. Columbus, OH: National Center for Research and Vocational Education.

National Center for Education Statistics. (Aug. 1995). High School and Beyond Fourth Follow-up (Sophomore Cohort) HS&B: 1992 [On-line]. Available: Internet: Gopher.ed.gov Directory: OERI & NCES/ File: DAS.

National Center for Education Statistics. (April, 1992). Vocational education in the United States: 1969-1990. Washington, DC: Authors.

Smith, C.L. & Rojewski, J.W. (1993, December). School-to-work transition: Alternatives for educational reform. Youth and Society, 25(2), 222-250.

U.S. Bureau of the Census. (1987a). Money, income and poverty status of families and persons in the U.S.: 1986 advance report. Washington, DC: U.S. Government Printing Office.

U.S. Bureau of the Census. (1993, October). Current population report; money, income of households, families, and persons in the United States: 1992 (Series P-60, No. 184). Washington, DC: U.S. Government Printing Office.

U.S. Bureau of Labor Statistics (1986a, September). Employment and earnings, 33(10). Washington, DC: U.S. Department of Labor.

U.S. Bureau of Labor Statistics (1986b, December). Employment and earnings, 33(12). Washington, DC: U.S. Department of Labor.

U.S. Bureau of Labor Statistics (1993, September). Employment and earnings, 40(9). Washington, DC: U.S. Department of Labor.

U.S. Department of Education. (1994). National Assessment of Vocational Education: Interim Report to Congress. Washington, DC: Author.

U.S. Government Accounting Office. (1991, August). Transition from school to work: Linking education and worksite training (GAO/HRD 91-105). Washington, DC: Author.

Virginia Department of Education. (1995, August). The Virginia system of core standards and measures of performance for secondary vocational education programs: 1993-94 statewide summary report. Richmond, VA: Authors.

The William T. Grant Foundation Commission on Work, Family and Citizenship. (1988a, January). The forgotten half: Non-college youth in America (Interim Report). Washington, DC: Author.

APPENDIX

SECONDARY SCHOOL TAXONOMY[1]

All secondary curriculum variables used in this study were organized using the taxonomic hierarchies reported by NCES (1992). This taxonomy divides secondary curriculum into three parts: academic, vocational, and personal/other.

The academic curriculum is further aggregated into six main subject areas: mathematics, science, English, social studies, fine arts, and foreign language.

The secondary vocational curriculum is subdivided in to three curriculum areas: consumer & homemaking education, general labor market preparation, and specific labor market preparation.

The personal/other curriculum is divided into general skills, personal health & physical education, religion, and military science.

Table 1

Variable Means and Standard Deviations for High School Graduate Subgroups

Variable	All		Female		African American		Hispanic/Latino	
	M	SD	M	SD	M	SD	M	SD
Annual Income	8749.78	13030.08	6923.54	13025.60	7178.88	12512.21	8429.29	14927.11
Months Employ	68.10	37.57	58.69	38.44	58.14	47.55	72.40	60.16
Vocational Credit	4.84	2.92	5.03	3.06	4.23	2.84	4.46	4.03
Had Co-op	0.15	0.32	0.12	0.51	0.11	0.31	0.07	0.30
Academic Credit	12.42	4.31	13.01	4.51	12.60	6.74	11.67	8.48
SES	43.52	27.00	39.97	27.63	27.76	29.98	31.52	38.15
Ability	394.01	26.29	381.48	27.38	223.03	29.98	252.85	31.56
H.S. Size	1304.74	858.81	1259.91	901.39	1334.89	1132.89	1517.43	1341.07

Note. Minimun pairwise n used in all analyses.

Table 2

Intercorrelations Among Variables for the All High School Graduates Sample

Variable	N	1	2	3	4	5	6	7	8
1. Annual Income	313	1.000							
2. Months Employ	550	0.073	1.000						
3. Vocational Credit	546	-.047	-.034	1.000					
4. Had Co-op	362	0.026	0.037	0.084	1.000				
5. Academic Credit	546	0.008	0.006	-.041	-.168	1.000			
6. SES	444	0.094	0.132	-.169	0.025	0.150	1.000		
7. Ability	404	0.079	0.076	-.201	-.014	0.241	0.289	1.000	
8. Size	471	0.035	0.090	-.094	-.008	0.084	0.087	0.011	1.000

Note. Minimum pairwise n = 313

48

Table 3

Intercorrelations Among Variables for the Female High School Graduates Subsample

Variable	N	1	2	3	4	5	6	7	8
1. Annual Income	108	1.000							
2. Months Employ	239	0.043	1.000						
3. Vocational Credit	236	-.150	-.091	1.000					
4. Had Co-op	156	0.009	-.046	0.075	1.000				
5. Academic Credit	263	0.090	0.079	-.149	-.148	1.000			
6. SES	194	0.128	0.170	-.208	0.019	0.243	1.000		
7. Ability	175	0.204	0.027	-.264	-.041	0.304	0.338	1.000	
8. Size	191	0.128	0.156	-.087	-.025	0.154	0.128	-.048	1.000

Note. Minimum pairwise n = 108

Table 4

Intercorrelations Among Variables for the African American High School Graduates Subsample

Variable	N	1	2	3	4	5	6	7	8
1. Annual Income	74	1.000							
2. Months Employ	110	0.017	1.000						
3. Vocational Credit	109	-.145	-.164	1.000					
4. Had Co-op	82	-.108	-.122	0.219	1.000				
5. Academic Credit	109	0.153	-.056	-.170	-.194	1.000			
6. SES	92	0.040	0.252	-.165	-.034	0.057	1.000		
7. Ability	80	0.104	-.080	-.297	-.087	0.315	-.041	1.000	
8. Size	92	-.107	0.016	-.205	-.069	-.329	0.163	-.008	1.000

Note. Minimun stepwise n = 74.

Table 5

Intercorrelations Among Variables for the Hispanic/Latino American High School Graduates Subsample

Variable	N	1	2	3	4	5	6	7	8
1. Annual Income	52	1.000							
2. Months Employ	92	-.026	1.000						
3. Vocational Credit	92	-.264	0.006	1.000					
4. Had Co-op	61	-.113	0.039	0.042	1.000				
5. Academic Credit	92	0.063	0.068	-.055	-.027	1.000			
6. SES	62	0.150	-.126	-.317	-.009	-.076	1.000		
7. Ability	42	0.226	-.278	-.219	-.194	0.091	0.303	1.000	
8. Size	75	0.185	-.360	-.433	0.008	-.201	-.107	-.033	1.000

Note. Minimum pairwise n = 42.

Table 6a
Least Squares Estimates of Parameters of the Economic Outcome Model for All Non-College Attending High School Graduates (n=313)

Standardized coeffecents							
	Independent variable						
Dependent variable	SES	Ability	HS Size	Academic Credit	Voc Ed Curric.	Co-op Exper.	Months Employ
Academic Credit	.080	.217**	.074				
Voc Ed Curric.	-.115*	-.173	-.084	.025**			
Co-op Exper.	.058	.032	.011	-.182**	.094		
Months Employ	.114*	.048	.081	-.024	-.001	.031	
Annual Income	.006	.054	.023	-.014	-.023	.024	.056

*p < .05
**p < .01

Table 6b
Least Squares Estimates of Parameters of the Economic Outcome Model for All Non-College Attending High School Graduates (n=313)

	Metric coeffecents[a]							
	Independent variable							
Dependent variable	SES	Ability	HS Size	Academic Credit	Voc Ed Curric.	Co-op Exper.	Months Employ	R^2
Academic	.128	.356	.037					.017
Credit	(.091)	(.094)	(.028)					
Voc Ed Curric.	-.125	-.192	-.029	.017				.061
	(.062)	(.065)	(.019)	(.039)				
Co-op Exper.	.007	.004	.000	-.014	.010			.040
	(.007)	(.007)	(.002)	(.004)	(.006)			
Months Employ	.159	.068	.036	-.021	-.002	.365		.027
	(.082)	(.087)	(.025)	(.051)	(.075)	(.670)		
Annual Income	.032	.027	.003	-.004	-.010	.097	.020	.017
	(.029)	(.030)	(.009)	(.018)	(.026)	(.234)	(.020)	

[a]Standard Errors in parentheses

Table 7a
Least Squares Estimates of Parameters of the Economic Outcome Model for Female Non-College Attending High School Graduates (n=108)

	Standardized coeffecents						
	Independent variable						
Dependent variable	SES	Ability	HS Size	Academic Credit	Voc Ed Curric.	Co-op Exper.	Months Employ
Academic Credit	.134	.265**	.150				
Voc Ed Curric.	-.115	-.215	-.076	-.044			
Co-op Exper.	.071	-.001	-.005	-.154	.066		
Months Employ	.152	-.040	.126	.021	-.053	-.040	
Annual Income	.033	.177	.124	-.001	-.087	.026	.006

*p < .05
**p < .01

Table 7b
Least Squares Estimates of Parameters of the Economic Outcome Model for Female Non-College Attending High School Graduates (n=108)

	Metric coeffecents[a]							
	Independent variable							
Dependent variable	SES	Ability	HS Size	Academic Credit	Voc Ed Curric.	Co-op Exper.	Months Employ	R^2
Academic Credit	.220	.437	.075					.136
	(.158)	(.158)	(.046)					
Voc Ed Curric.	-.127	-.240	-.026	-.030				.094
	(.111)	(.114)	(.032)	(.067)				
Co-op Exper.	.008	-.000	-.000	-.011	.007			.029
	(.012)	(.013)	(.004)	(.007)	(.011)			
Months Employ	.211	-.057	.054	.018	-.067	-.468		.053
	(.143)	(.149)	(.041)	(.087)	(.124)	(1.125)		
Annual Income	.015	.084	.018	-.000	-.037	.102	.002	.070
	(.049)	(.050)	(.014)	(.029)	(.042)	(.378)	(.033)	

[a]Standard Errors in parentheses

Table 8a
Least Squares Estimates of Parameters of the Economic Outcome Model for African American Non-College Attending High School Graduates (n=74)

Standardized coeffecents							
	Independent variable						
Dependent variable	SES	Ability	HS Size	Academic Credit	Voc Ed Curric.	Co-op Exper.	Months Employ
Academic Credit	.127	.318**	-.347**				
Voc Ed Curric.	-.127	-.253	-.240	-.162			
Co-op Exper.	.025	.031	-.107*	-.211	.174		
Months Employ	.241*	-.090	-.109	-.128	-.169	-.117	
Annual Income	.038	.040	-.124	.061	-.129	-.072	-.013

*p < .05
**p < .01

Table 8b
Least Squares Estimates of Parameters of the Economic Outcome Model for African American Non-College Attending High School Graduates (n=74)

	Metric coeffecents[a]							
	Independent variable							
Dependent variable	SES	Ability	HS Size	Academic Credit	Voc Ed Curric.	Co-op Exper.	Months Employ	R^2
Academic Credit	.285	.848	-2.066					.222
	(.237)	(.286)	(.623)					
Voc Ed Curric.	-.120	-.284	-.600	-.068				.173
	(.103)	(.127)	(.035)	(.051)				
Co-op Exper.	.003	.004	-.030	-.010	.019			.083
	(.012)	(.015)	(.035)	(.006)	(.014)			
Months Employ	.383	-.170	-.456	-.091	-1.774	-1.774		.115
	(.131)	(.228)	(.520)	(.091)	(1.743)	(1.743)		
Annual Income	.016	.020	-.137	.011	-.057	-.288	-.004	.055
	(.051)	(.062)	(.142)	(.025)	(.057)	(.476)	(.032)	

[a]Standard Errors in parentheses
*p < .05
**p < .01

Table 9a
Least Squares Estimates of Parameters of the Economic Outcome Model for Hispanic/Latino American Non-College Attending High School Graduates (n=42)

	Standardized coeffecents						
	Independent variable						
Dependent variable	SES	Ability	HS Size	Academic Credit	Voc Ed Curric.	Co-op Exper.	Months Employ
Academic Credit	-.137	.126	-.212				
Voc Ed Curric.	-.351**	-.113	-.590***	-.174			
Co-op Exper.	.065	-.208	.019	.003	.025		
Months Employ	-.217	-.309*	-.569***	-.056	-.379*	-.004	
Annual Income	.112	.194	.232	.085	-.079	-.075	.123

*p < .05
**p < .01
***p < .001

Table 9b
Least Squares Estimates of Parameters of the Economic Outcome Model for Hispanic/Latino American Non-College Attending High School Graduates (n=42)

	Metric coeffecents[a]							
	Independent variable							
Dependent variable	SES	Ability	HS Size	Academic Credit	Voc Ed Curric.	Co-op Exper.	Months Employ	R^2
Academic Credit	-.304	.338	-1.339					.135
	(.354)	(.426)	(.961)					
Voc Ed Curric.	-.370	-.144	-1.527	-.082				.366
	(.140)	(.168)	(.384)	(.061)				
Co-op Exper.	.005	-.020	-.004	.000	.002			.041
	(.014)	(.016)	(.041)	(.006)	(.014)			
Months Employ	-.343	-.590	-2.553	-.040	-.567	-.081		.312
	(.236)	(.269)	(.704)	(.097)	(.243)	(2.659)		
Annual Income	.044	.092	.258	.015	-.029	-.374	.031	.135
	(.067)	(.079)	(.225)	(.027)	(.072)	(.740)	(.044)	

[a]Standard Errors in parentheses

Table 10
Indirect Effects of Exogenous Variables on Endogenous Variables by Subgroup

(All High School Graduates)

	Endogenous variable				
Exogenous variable	Annual Income	Months Employ	Voc. Ed. Curric.	Co-op Exper.	Acad. Credit
SES	.004	-.001	.002	-.003	.000
Ability	.001	-.008	.006	-.007	.000
HS Size	.001	-.001	.001	-.001	.000
Months Employ	0	0	0	0	0
Voc. Ed. Curric.	.001	.004	.000	.000	.000
Co-op Exper.	.007	.000	.000	.000	.000
Academic Credit	-.002	-.005	.000	.000	.000

(Female High School Graduates)

	Endogenous variable				
Exogenous variable	Annual Income	Months Employ	Voc. Ed. Curric.	Co-op Exper.	Acad. Credit
SES	.006	.011	-.007	-.003	.000
Ability	.009	.028	-.013	-.007	.000
HS Size	.001	.004	-.002	-.001	.000
Months Employ	0	0	0	0	0
Voc. Ed. Curric.	.001	-.003	.000	.000	.000
Co-op Exper.	-.010	.000	.000	.000	.000
Academic Credit	.000	.007	.000	-.000	.000

Table 10 continued
Indirect Effects of Exogenous Variables on Endogenous Variables by Subgroup

(African American High School Graduates)

	Endogenous variable				
Exogenous variable	Annual Income	Months Employ	Voc. Ed. Curric.	Co-op Exper.	Acad. Credit
SES	.011	.019	-.019	-.006	.000
Ability	.033	.040	-.058	-.015	.000
HS Size	.008	.349	.140	.011	.000
Months Employ	0	0	0	0	0
Voc. Ed. Curric.	-.004	-.034	.000	.000	.000
Co-op Exper.	.006	.000	.000	.000	.000
Academic Credit	.007	.039	.000	-.001	.000

(Hispanic/Latino American High School Graduates)

	Endogenous variable				
Exogenous variable	Annual Income	Months Employ	Voc. Ed. Curric.	Co-op Exper.	Acad. Credit
SES	-.000	.207	.025	-.001	.000
Ability	.002	.086	-.028	-.000	.000
HS Size	-.031	.356	.110	-.003	.000
Months Employ	0	0	0	0	0
Voc. Ed. Curric.	-.018	-.000	.000	.000	.000
Co-op Exper.	-.003	.000	.000	.000	.000
Academic Credit	.003	.047	.000	-.000	.000

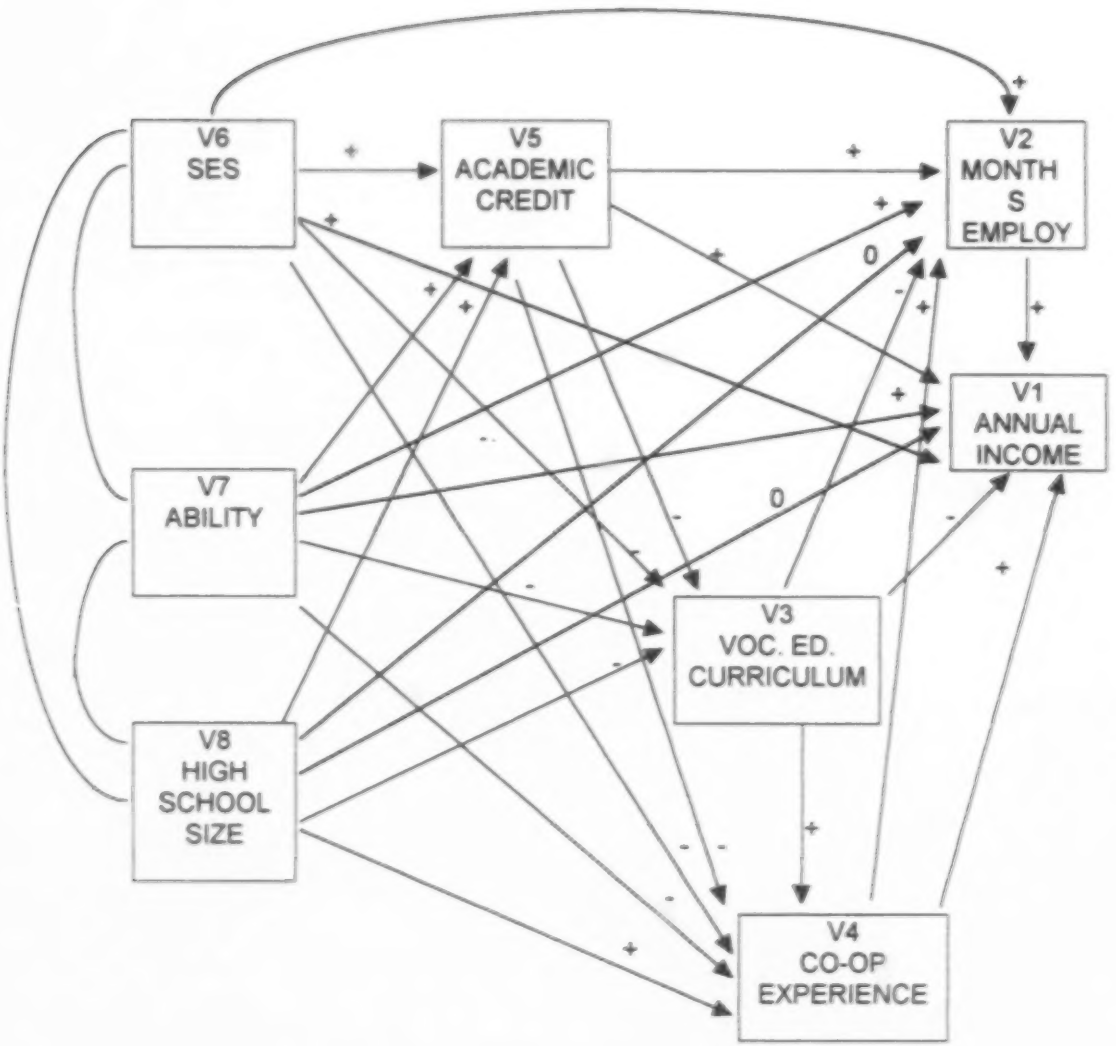

Figure 1. **Hypothesized Causal Model for All Non-college Attending High School Graduates and female, African-American, and Hispanic-American subgroups**